



Online Experiments with jsPsych

Introduction to jsPsych

January 26, 2021



jsPsych

- ▶ What is jsPsych?
 - ▶ JavaScript library for running experiments in the browser
- ▶ Useful links
 - ▶ jsPsych Website
 - ▶ jsPsych Code
 - ▶ jsPsych Paper
 - ▶ YouTube Tutorial 1
 - ▶ YouTube Tutorial 2
 - ▶ YouTube Tutorial 3



jsPsych

- ▶ Running behavioural studies online: Is it valid?
- ▶ Useful references
 - ▶ Bridges, D., Pitiot, A., MacAskill, M. R., & Peirce, J. W. (2020). The timing mega-study: comparing a range of experiment generators, both lab-based and online. PeerJ, 8, e9414.
 - ▶ de Leeuw, Joshua R., and Benjamin A. Motz. "Psychophysics in a Web browser? Comparing response times collected with JavaScript and Psychophysics Toolbox in a visual search task." Behavior Research Methods 48.1 (2016): 1-12.
 - ▶ Hilbig, B. E. (2016). Reaction time effects in lab-versus Web-based research: Experimental evidence. Behavior Research Methods, 48(4), 1718-1724.



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► Advantages

- Late 2020/early 2021 only option for data collection! (Covid-19)
- Very quick way to collect many participants
- Access different population pools (e.g., age, native language)
 - Mechanical Turk/Prolific



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- ▶ What do we need?
 - ▶ Text Editor (Vim, VS Code, Sublime Text, R-Studio etc.)
 - ▶ Need to edit .js (95%), .html, and .css files
 - ▶ Syntax highlighting!
 - ▶ Web-Browser
 - ▶ Need to test on most commonly used browsers (e.g., Firefox, Chrome, and Safari)
 - ▶ jsPsych library
 - ▶ Web Server (e.g., Pavlovia)
 - ▶ Not required for local development/initial testing
 - ▶ Git (required for interaction with Pavlovia + useful in general for code development)
 - ▶ Git link



Git

- ▶ What is Git?
 - ▶ Git is version control software
 - ▶ We can use it to keep track of changes in our experiment code (complete history of changes)
 - ▶ Avoid need for myexperiment180121.js, myexperiment190121_test_change.js, myexperiment190121_other_change.js, and so on
 - ▶ Makes collaboration easier (share code, use code from others)
- ▶ What is GitHub/GitLab
 - ▶ Two separate online hosts for Git projects
 - ▶ GitHub
 - ▶ GitLab



Git Basics: Walk-through I

- ▶ Create a new project (local computer)
 - ▶ README.md file
 - ▶ `git init .` directory
 - ▶ `git add .`
 - ▶ `git status`
 - ▶ `git commit`
- ▶ Create a repository on GitHub¹ or GitLab
 - ▶ Your account → Your repositories → New
 - ▶ Repository name → Create repository
 - ▶ Option → ... or push an existing repository from the command line

¹Instructions refer to GitHub



Git Basics: Walk-through II

- ▶ Upload our local repository to GitHub or GitLab
 - ▶ `git remote add origin https://github.com/igmmgi/XXX.git`
 - ▶ `git branch -M main2`
 - ▶ `git push -u origin main`
- ▶ Locate project to clone (on GitHub/GitLab)
 - ▶ Code → Copy/Paste
- ▶ Clone an existing project (local computer)
 - ▶ `git clone XXX`
 - ▶ `git log`
- ▶ Clone TuebingenWorkshopOnlineExperiments which contains the course materials
 - ▶ `git clone https://github.com/igmmgi/TuebingenWorkshopOnlineExperiments.git`
 - ▶ `git pull`

² master to main name change 2020/2021



jsPsych: Getting Started

- ▶ Three related technologies
 - ▶ HTML (Hypertext Markup Language) with file extension .html
 - ▶ Controls the content on the webpage
 - ▶ CSS (Cascading Style Sheets) with file extension .css
 - ▶ Controls the style on the webpage
 - ▶ JavaScript with file extension .js
 - ▶ Used to add some interaction



HTML + CSS + javascript

▶ Useful resources

- ▶ w3schools.com (HTML)
- ▶ w3schools.com (CSS)
- ▶ w3schools.com (javascript)

▶ Demo Files

- ▶ example.html
- ▶ example_with_inline_css.html
- ▶ example_with_spearate_css_file.html and example.css
- ▶ example_with_javascript.html



jsPsych basics

- ▶ Combination of javascript, html, css
- ▶ Specific high-level code for behavioural experiments
 - ▶ Present text/images/sounds/movies
 - ▶ Record key-presses, reaction times, slider responses etc.
 - ▶ Organise data
 - ▶ Randomisation procedures
- ▶ Built around the idea pre-defined trial-types or plugins
 - ▶ Easy to use
 - ▶ Requires very little actual coding
 - ▶ Covers a wide-range of use cases
 - ▶ We can also create custom plugins for more specific experiments (requires a little bit of coding)



jsPsych: A first “experiment”

▶ Demo Files

- ▶ jspsych_exp1.html & jspsych_exp1.js
- ▶ jspsych_exp2.html & jspsych_exp2.js
- ▶ jspsych-6.2.0/examples/



jsPsych: Posner Task

- ▶ Files
 - ▶ TuebingenWorkshopOnlineExperiments/jsPsych/posner_task
- ▶ Walk-through ...



jsPsych: Posner Task (Pavlovian)

- ▶ Useful link
 - ▶ Pavlovian Instructions for jsPsych
- ▶ Walk-through ...